

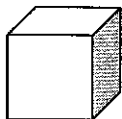
Name

Key

Date

## Areas and Volumes—Prisms and Cylinders

1. Find the total area and volume of a cube with an edge of length = 3.



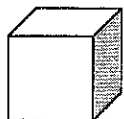
TA 9.6

V = 9.3

54 u<sup>2</sup>

27 u<sup>3</sup>

2. Find the total area and volume of a cube with an edge of length = 6.



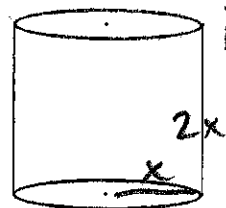
TA 36.6

36.6

216 u<sup>3</sup>

216 u<sup>3</sup>

3. The volume of a cylinder is 36π cm
- <sup>3</sup>
- . The height is equal to 2 x radius. What is the radius?



$$36\pi = Bh$$

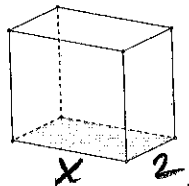
$$\pi x^2 \cdot 2x$$

$$36\pi = 2\pi x^3$$

$$\sqrt[3]{18\pi x^3}$$

$$2.62 = x$$

4. The lateral area of a rectangular prism is 48 in
- <sup>2</sup>
- . The height is equal to the length. The width is 2 in. What is the volume of the prism? (Note: you will need to set your equation = 0 and factor.)



LA = Ph

48 = (2x + 4)x

48 = 2x<sup>2</sup> + 4x

2x<sup>2</sup> + 4x - 48 = 0

x<sup>2</sup> + 2x - 24 = 0

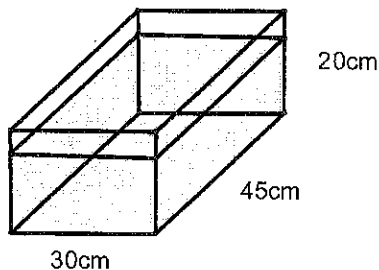
$$(x + 6)(x - 4)$$

$$x = -6 \quad x = 4$$

V = 4 · 2 · 4

32 in<sup>3</sup>

5. A fish tank is filled with water. The dimensions of the water are shown. When a rock is submerged, the water level rises 2cm. What is the volume of the rock?



V<sub>w1</sub> = 30 · 45 · 22 = 29700

V<sub>w10</sub> = 30 · 45 · 20 = 27000

2700 cm<sup>3</sup>

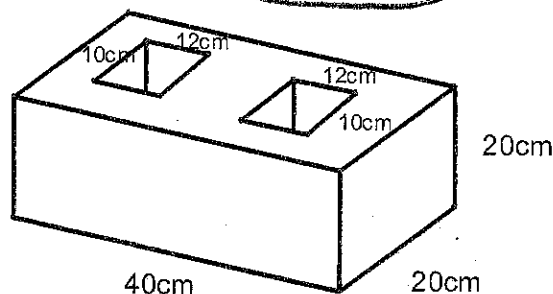
6. Find the volume of the cement block shown.

$$V = V_{Big} - 2V_{small}$$

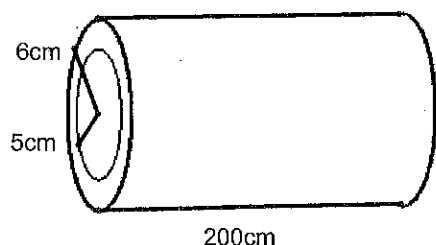
$$40 \cdot 20 \cdot 20 - 2(12 \cdot 10 \cdot 20)$$

$$16000 - 4800$$

11200 cm<sup>3</sup>



7. A pipe is 200cm long and has an inside radius of 5cm and an outside radius of 6cm. How many cubic cm of metal are in the pipe?



$$V_{Bis} - V_{Sm}$$

$$36\pi \cdot 200 - 25\pi \cdot 200$$

$$7200\pi - 5000\pi$$

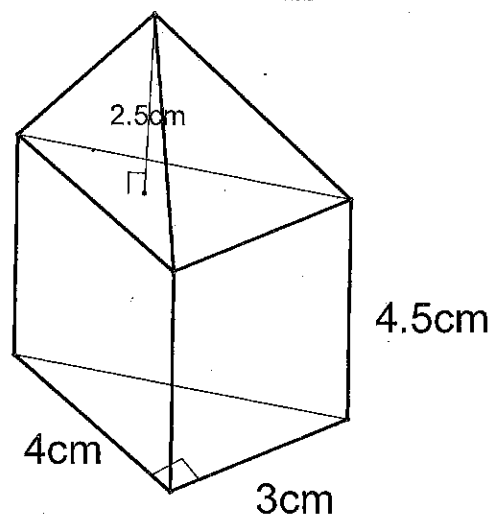
$$2200\pi \text{ cm}^3 \approx 6911.5 \text{ cm}^3$$

8. Find the volume of the solid to the right.

(The volume of the pyramid is  $5\text{cm}^3$ .)

$$V_{\text{prism}} = \frac{1}{2} \cdot 4 \cdot 3 \cdot 4.5$$

$$\begin{array}{r} 27 \\ + 5 \\ \hline 32 \text{ cm}^3 \end{array}$$



9. The volume of a triangular prism is  $48\sqrt{3}\text{cm}^3$ . The base is an equilateral triangle with one side = 8cm. What is the height of the prism?

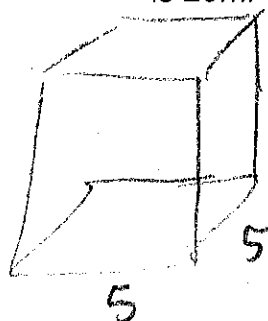
$$48\sqrt{3} = B \cdot h$$

$$\frac{64\sqrt{3}}{4}$$

$$48\sqrt{3} = 16\sqrt{3} h$$

$$h = 3 \text{ cm}$$

10. The total surface area of a square prism is  $180\text{m}^2$ . The perimeter of the base is 20m. What is the height of the prism?

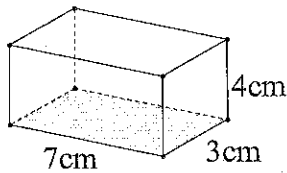


$$TA = LA + 2B$$

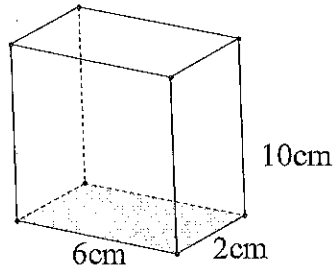
$$180 = 20 \cdot h + 2(25)$$

$$6.5 \text{ m} = h$$

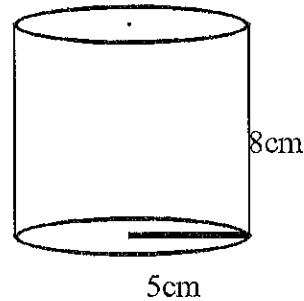
Please find the following: perimeter of the base = p, area of the base = B, LA, TA, and V.



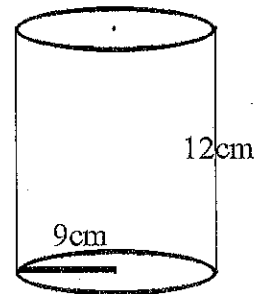
$$\begin{aligned} 11. \quad p &= 20\text{cm} \\ B &= 21\text{cm}^2 \\ LA &= 80\text{cm}^2 \\ TA &= 122\text{cm}^2 \\ V &= 84\text{cm}^3 \end{aligned}$$



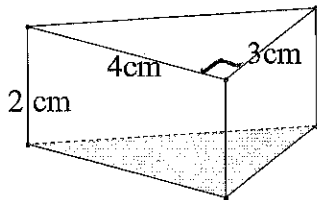
$$\begin{aligned} 12. \quad p &= 16\text{cm} \\ B &= 12\text{cm}^2 \\ LA &= 160\text{cm}^2 \\ TA &= 184\text{cm}^2 \\ V &= 120\text{cm}^3 \end{aligned}$$



$$\begin{aligned} 13. \quad C &= 10\pi\text{cm} \\ B &= 25\pi\text{cm}^2 \\ LA &= 80\pi\text{cm}^2 \\ TA &= 130\pi\text{cm}^2 \\ V &= 200\pi\text{cm}^3 \end{aligned}$$

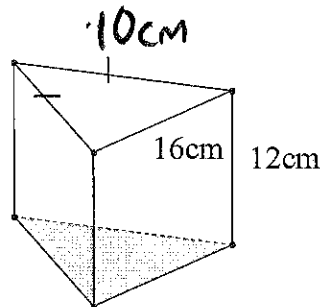


$$\begin{aligned} 14. \quad C &= 18\pi\text{cm} \\ B &= 81\pi\text{cm}^2 \\ LA &= 216\pi\text{cm}^2 \\ TA &= 378\pi\text{cm}^2 \\ V &= 972\pi\text{cm}^3 \end{aligned}$$



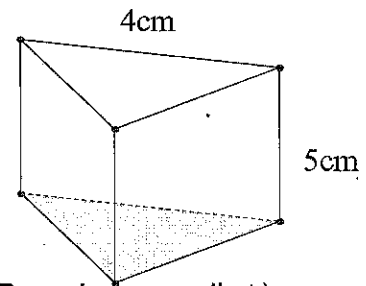
(Base is a rt.  $\Delta$ )

$$\begin{aligned} 15. \quad p &= 12\text{cm} \\ B &= 6\text{cm}^2 \\ LA &= 24\text{cm}^2 \quad 12 \cdot 2 \\ TA &= 36\text{cm}^2 \quad 24 + 2(6) \\ V &= 12\text{cm}^3 \end{aligned}$$



(Base is an isosceles  $\Delta$ )

$$\begin{aligned} 16. \quad p &= 36\text{cm} \\ B &= 48\text{cm}^2 \quad B = \frac{1}{2} \cdot 6 \cdot 16 \\ LA &= 432\text{cm}^2 \\ TA &= 528\text{cm}^2 \\ V &= 576\text{cm}^3 \end{aligned}$$



(Base is an equil.  $\Delta$ )

$$\begin{aligned} 17. \quad p &= 12\text{cm} \\ B &= 4\sqrt{3}\text{cm}^2 \quad \frac{4^2\sqrt{3}}{4} = B \\ LA &= 60\text{cm}^2 \\ TA &= 73.9\text{cm}^2 \\ V &= 20\sqrt{3} \approx 34.6\text{cm}^3 \end{aligned}$$

